

REMARKS/ARGUMENTS

Claims 1-38 are pending. Claims 1 and 2 have been amended. Reconsideration is respectfully requested.

1. Rejection of Claims 1-19 Under §101

Claims 1-19 stand rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention.

Under the recent en banc decision in *In re Bilski*, 545 F.3d 943, 88 USPQ2d 1385 (Fed. Cir. 2008), the court held a claimed process is a statutory process under 35 U.S.C. 101 if (1) it is tied to a particular machine or apparatus, or (2) it transforms a particular article into a different state or thing.

Claim 1 recites a process that transforms an electronic image of a field of view containing an object, by identifying groups of image pixels that represent edge segments of the object, where patches are formed around those image pixel groups, and the patches are merged together using a proximity threshold process. The resulting image contains one or more patches resulting from the merge process, which were not present in the originally formed electronic image. Thus, the electronic image is transformed into a different state or thing, and thus meets the second criteria set forth in *In re Bilski* as patentable subject matter.

Notwithstanding the above, in order to expedite the prosecution of this application, claims 1 and 2 have been amended to recite that it is an imaging system that is used to form the electronic image, and that the identifying, forming and performing steps are performed using the at least one processor. Therefore, claims 1-2 (and claims 3-19) are also tied to a particular machine or apparatus, and thus additionally meet the first criteria set forth in *In re Bilski* as patentable subject matter.

It is therefore respectfully submitted that claims 1-19 are directed to patentable subject matter under §101, and that this rejection should be withdrawn.

2. Rejection of Claims 1-38 Under §103(a)

Claims 1-38 stand rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent 4,538,299 (DeForest) in view of U.S. Patent Publication 2002/0031255A1 (Kasdan). The Applicant respectfully traverses this rejection.

Independent claims 1 and 20 recite a system and method for locating a boundary of an object by:

- 1) forming an image of the object,
- 2) identifying groups of the image pixels representing edge segments of the object,
- 3) forming patches around the image pixel groups that are each dimensioned and positioned to entirely contain one of the image pixel groups,
- 4) performing a patch merge process that merges any two of the patches together that meet a predetermined proximity threshold relative to each other to form a merged patch that is dimensioned and positioned to entirely contain the two merged patches, and
- 5) continuing the merge process for any of the patches and the merged patches meeting the predetermined proximity threshold until none of the patches and the merged patches meet the predetermined proximity threshold.

This technique more reliably groups together edge segments representing the boundary of a single particle, without unnecessarily including edge segments that are either non-particles or should be associated with another particle, thus allowing any gaps between edge segments from a single particle to be filled in to form a single and continuous particle edge (see specification page 8, lines 20-25).

The Examiner acknowledges on page 4 of the Office Action that DeForest fails to disclose the patch formation and merge of claims 1 and 20. The Examiner states, however, that Kasdan discloses the claimed patch formation and merge of claims 1 and 20 (citing to paragraphs 0043, 0047, 0048 and 0050), and that it would have been obvious to use the Kasdan patch formation/merge in DeForest's automatic location of the object boundary. The Applicant respectfully disagrees that Kasdan discloses the claimed patch formation/merge.

Kasdan discloses a multi-neural net imaging apparatus and method for classification of image elements, such as biological particles (see Abstract). As part of that process, the system isolates the particles in successive fields of images (see paragraph [0043]). While Kasdan contemplates using a patch extraction apparatus to define local areas (patches) containing particles of interest whereby the boundary of each particle is identified and defined (see paragraph [0043]), Kasdan does not contemplate or suggest doing so by merging patches using a proximity threshold, let alone continuing the merge of patches and merged patches until none of them meet the proximity threshold, as recited in claims 1 and 20. Kasdan does contemplate using a threshold routine to detect edges. However, this threshold routine compares pixel intensity values to a threshold (see paragraph [0047]). Applying an intensity threshold on pixel values is distinguishable from (i.e. does not teach or suggest) using a proximity threshold on patches.

On page 4 of the Office Action, the Examiner states that Kasdan teaches the claimed patch formation with patches dimensioned and positioned to entirely contain one of the image pixel groups, citing the following text from Kasdan:

- Paragraph [0043]:

produced by the imaging system and to define local areas (patches) containing particles of interest. The boundary of each particle is identified and defined, and used to extract the picture data for each particle from the larger field, thereby

To the contrary, all that this cited language discloses is the concept that patches are used to define local areas containing particles of interest. There is no suggestion of using patches to define edge segments, as opposed to simply using each patch to define an entire particle of interest.

On pages 4-5 of the Office Action, the Examiner states several sections of Kasdan teach the claimed patch merge process, which the Applicant respectfully traverses as follows:

- Paragraph [0043]:

produced by the imaging system and to define local areas (patches) containing particles of interest. The boundary of each particle is identified and defined, and used to extract the picture data for each particle from the larger field, thereby producing digital patch images that each contain the image of an individual particle of interest (resulting in a significant compression of the data subsequently required for processing). Imaging system 2 and first processor 4 combine to perform the first step (collection of individual images) shown in FIG. 1.

This text merely discloses that the extraction apparatus is used to define local areas (i.e. patches) containing the particle of interest. There simply is no disclosure or suggestion that patches are merged, let alone that the extraction apparatus uses a proximity threshold to perform the patch merge.

- Paragraph [0047]:

followed by a gradient image. A threshold routine is used to detect the edges, whereby the locations where the intensity crosses a predetermined threshold are defined as edges. The detected edges are connected together to result in an edges image 16, which contains lines that correspond to detected boundaries that outline the various particles.

This text merely discloses a threshold routine where the intensity levels associated with the pixels forming the image are analyzed, and edges are determined to be at those locations where the intensity levels cross a predetermined threshold. It is respectfully submitted that applying a pixel intensity threshold to individual pixel intensity values (for the purposes of identifying which pixels represent the particle edge) does not teach or suggest applying a proximity threshold to adjacent patches (for the purposes of merging proximate patches together).

On page 5 of the Office Action, the Examiner states the following section of Kasdan allegedly teaches continuing the merging process until none of the patches and the merged patches meet the predetermined proximity threshold:

- Paragraph [0047]:

followed by a gradient image. A threshold routine is used to detect the edges, whereby the locations where the intensity crosses a predetermined threshold are defined as edges. The

This text merely discloses an intensity threshold to pixel values, not a proximity threshold to patches, let alone the continuation of the patch merge process until none of them meet the proximity threshold as recited in claims 1 and 20.

Because neither cited reference teaches or suggests the claimed patch formation and merge, it is respectfully submitted that claims 1 and 20 are not rendered obvious by DeForest in view of Kasdan, and that this rejection should be withdrawn.

With respect to claims 2-19 and 21-38, these claims depend from claims 1 or 20, and are therefore considered allowable for the reasons set forth above. Moreover, because neither DeForest or Kasdan teach or suggest the claimed patch formation and merge as recited in independent claims 1 or 20, they certainly do not teach or suggest the particular and more specific features of the patch formation and merge as recited in these dependent claims.

For the foregoing reasons, it is respectfully submitted that the claims are in an allowable form, and action to that end is respectfully requested.

FEES: It is submitted that no fees are due with this submission. However, should it be determined that fees have been incurred by this submission, the Commissioner is hereby authorized to charge any fees which may be required, or credit in the overpayment, to Deposit Account No. 07-1896 referencing Attorney Docket No. 351918-914991.

Respectfully submitted,

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